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CENTRAL STATISTICAL OFFICE OF THE UNION OF SOVIET SOCIALIST REPUBLICS

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Moscow

MEASUREMENT OF PRODUCTIVITY AT THE FIRM LEVEL*

(Item 11 of the provisional agenda)

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I. INTRODUCTION

1. In Japan, there exist several types of measurements of labour productivity, both value and physical measurements, at national, industry and firm levels. The most important measurements are as follows:

(a) Labour productivity at national level, based on the national accounts statistics;

(b) Labour productivity indices, covering manufacturing, mining and public utilities, compiled by the Japan Productivity Center;

(c) Labour productivity statistical survey, covering productivity at firm level in the manufacturing industry, conducted by the Ministry of Labor.

2. Among these measurements, the third one, the labour productivity survey, may be useful as a guideline for developing firm level productivity measurements. For industries other than manufacturing, although some productivity statistics are compiled from the secondary data, firm level measurements by direct survey method are not available.

II. BACKGROUND

3. It was after the World War II, that the importance of labour productivity was widely recognized in Japan. For the recovery of the war-devastated economy and for the expansion of export trade, increase of labour productivity was one of the most important factors. Therefore, correct information on the labour productivity concerning the Japanese economy became absolutely necessary.

4. As for the productivity statistics, shortly after the war Japan began compiling over-all labour productivity indices for manufacturing, which were derived by dividing the production indices by the employment indices.

5. After some preliminary surveys, the "Labor Productivity Statistical Survey", covering four industries, namely cotton spinning, ammonium sulphate, cement, and iron and steel, was conducted for the first time in 1952.

6. The scope of the survey was revised several times and the under-mentioned additions and deletions were made:

1954 Rayon, paper, pulp, motor vehicles, and steel rolling were added.

1955 Soda, carbide, tires and inner tubes, wool spinning, and electric motors were added.

1962 Cotton and spun rayon fabrics, lathes, steel and iron castings, bearings, and watches were added.

1967 Plywood, and electric wire and cable were added, but carbide was excluded.

1980 Watches were excluded.

/III.

III. CHARACTERISTICS OF THE SURVEY

A. OUTPUT

7. Output is measured in physical terms (e.g. tons of cotton yarn, square meters of fabrics, tons of pig iron, number of electric motors, number of passenger cars).

8. If the products are homogeneous or considered to be fairly homogeneous, the output data can be aggregated without much difficulty. Examples are: pig iron produced by blast furnace, cement. However, when the products are heterogenous, the measurement of output is not so simple.

9. In such a case, two methods are adopted to measure output of heterogeneous products. One is the use of conversion ratios. In some industries, one of the products is selected as a standard and other products are converted into standard units by using coversion ratios. Examples are: cotton yarn, woollen yarn, tires and inner tubes. In the case of cotton yarn, yarn count 20 (written as 20^s) is used as a standard, and the output of other counts of yarn is converted into the output of this count of yarn (20^s).

10. Another method is that output is measured for each product, or for a group of products which can be considered as fairly homogeneous. Examples are: paper, steel rolling, motor vehicles. In the case of paper, the output is measured for each of the following products.

Paper:	Paper board:
(1) newsprint paper	(1) liner
(2) printing paper	(2) corrugating medium
(3) kraft paper	(3) board
(4) tissue paper	(4) miscellaneous
(5) sanitary paper	
(6) miscellaneous	

B. INPUT

11. Input data are measured by hours worked of production workers for each production process. Managerial and clerical workers are not covered. A few examples of production process are given below.

Cotton spinning industry:

Direct

(1) Bale opening, mixing
(2) Carding
(3) Combing
(4) Drawing
(5) Roving
(6) Spinning

/Indirect

Indirect

Repairs, electricity, boiler, air conditioning.

Gray iron castings:

Direct

(1) Sand preparation
(2) Molding
(3) Melting
(4) Cores
(5) Heat treatment
(6) Finishing

Indirect

(1) Conveyance
(2) Testing and inspection
(3) Repairs
(4) Power station

C. LABOUR PRODUCTIVITY

12. Labour productivity is measured as working hours required for production of unit product. Therefore, labour productivity (unit labour requirements) may be expressed by:

$$\frac{m_1}{q} \ , \ \frac{m_2}{q} \ , \ \ldots\ldots\ldots\ldots \frac{m_n}{q}$$

where m_1 , m_2, ... m_n are hours worked at the production process 1, 2, ..., n.

q is the output of the product

This expression is the reciprocal of the commonly used expression of labour productivity. The main advantage of this expression, hours worked per unit of product, is that they can be directly added or subtracted. It is possible to compute the number of hours of work necessary to perform the different phases of a production process, and, therefore, to compare from plant to plant the labour productivity, even when some parts of the production process of each plant are different.

13. For example, if comparisons are required between two cotton textile plants, where in one plant the cotton is spun and then woven, while in the other only the weaving stage is performed, it will be possible for the first plant to show separately, in the total unit labour requirements, those needed to spin the cotton data collected for the second plant.

IV. SURVEY METHODOLOGY

14. The survey is carried out in February of each year (1) covering the period January to December of the previous year for the following industries: cotton spinning, wool spinning, cotton and spun rayon fabrics, steel and iron castings, lathes, and (2) covering the period October to November in the case of other industries.

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15. The survey is carried out by the mail system. A personal interview survey by our staff members is also carried out to obtain more detailed information, especially on the factors affecting labour productivity.

16. Two types of schedules are used for obtaining data for each industry. The first one is the main schedule, in which data on output and input are collected, and the other a supplementary schedule in which data on factors influencing labour productivity are collected.

17. The survey items of the above mentioned schedules are as follows:

(a) Main schedule

(i) Name of the establishment

(ii) Location of the establishment

(iii) Output of main products

(iv) Hours worked for the production of these main products by production process

(b) Supplementary schedule

(i) Main equipments, machinery and its rate of operation

(ii) Number of workers by production process

(iii) Change in the number of workers from previous years and reasons for the change

(iv) Measures taken by the establishment to increase labour productivity (description according to the following items)

(1) Introduction of new equipments

(2) Automatization of equipments

(3) Concentration of production on high capacity equipments

(4) Shortening of production process

(5) Improvement of equality control

(6) Decrease in the number of parts

(7) Reallocation of workers

(8) Employment of temporary or part-time workers

(9) Introduction or improvement of shift system

(10) Changes in working hours

(11) Small group activity (e.g. Quality control circle, Zero defect movement)

(12) Improvement in work motion

(13) Others

V. COVERAGE

Industries and products

Industries	Products
Cotton spinning	cotton yarn
Wool spinning	worsted yarn, woolen yarn
Cotton and spun rayon fabrics	broad woven fabrics
Plywood	plywood
Pulp	(sulphite pulp, kraft pulp, (semi chemical pulp, chemiground (pulp, ground pulp
Paper	machine made paper, paper board
Ammonium fertilizer	ammonium sulphate, urea
Soda	caustic soda
Rayon	(rayon filament, rayon staple (filament
Tires and inner tubes	(tires and inner tubes for motor (vehicles
Iron and steel	(pig iron produced by blast furnace (steel ingot (by converter (by electric furnace
Steel rolling	hot rolled steel, cold rolled steel
Steel and iron casting	(steel casting, gray iron casting (malleable iron casting
Electric wire and cable	bare wire
Lathes	lathes
Bearings	ball bearings, roller bearings
Electric motors	standard induction motors (capacity of 11 kW and under)
Motor vehicles	motor vehicles (cylinder displacement over 550^{cc})

/Watches

Watches (excluded in 1980)	wrist watch movements (mechanical type)

18. In the case of 12 industries, establishments, which produce the above-mentioned products, are surveyed by complete enumeration.

19. In the case of the other 8 industries (cotton and spun rayon fabrics, plywood, pulp, paper, iron and steel, steel rolling, steel and iron casting, electric wire and cable), random sampling method or cut-off sampling method is applied to select survey establishments.

20. The number of establishments surveyed is roughly 2,000.

VI. CALCULATION PROCEDURES

21. Industries which have a single product:

In this case, the labour productivity or the unit labour requirements is computed as:

$$l = \frac{m}{q}$$

where

l : labour productivity (unit labour requirements)

m : man-hours worked for the production of q

q : output of the product

The index number of labour productivity is simply a ratio of two periods of time.

This ratio can be expressed as follows:

$$li / lo$$

where lo : represents labour productivity at the base period.

li : labour productivity at the period i.

Industries which have two or more products:

For an industry which has two or more products, the labour productivity for each of the products is calculated as:

$$l^{(i)} = \frac{m^{(i)}}{q^{(i)}}$$

where

$l^{(i)}$: labour productivity for product i

/$m^{(i)}$

$m^{(i)}$: man-hours worked for the production of $q^{(i)}$

$q^{(i)}$: output of the product i

The labour productivity index for each product can be calculated by the same method mentioned above.

The index for product i is:

$li^{(i)} / lo^{(i)}$ or simply li / lo

The labour productivity index for such industry can be expressed as follows:

$$\Sigma \left(\frac{qo\ lo}{\Sigma qo\ lo} \right) \frac{li}{lo} \qquad \ldots\ldots\ldots\ldots \quad (A)$$

where

lo : labour productivity for one of the products at the period 0

li : labour productivity for the same product at the period i

qo : quantity of the product produced at the period o

This formula (A) is the weighted average of labour productivity index for each product. And the weight is the base period labour input weight.

This formula (A) can be converted as:

$$A = \frac{\Sigma qo\ lo \times \frac{li}{lo}}{\Sigma qo\ lo} = \frac{\Sigma qo\ li}{\Sigma qo\ lo} \qquad \ldots\ldots\ldots \quad (B)$$

Therefore the meaning of this formula (B) can be explained as the ratio of the total labour that would have been spent to produce base period complex of products, with the current unit labour requirements, to the total labour actually spent in the base period.

The general index for the total of all surveyed industries can be calculated by a method similar to the formula (A).

VII. RECENT RESULTS

22. Table 1 shows that in 1979, labour productivity in the covered industries increased by 8.4 per cent, a little larger than 8.2 per cent of the previous year.

23. In 1979, labour productivity increased in all of the survey industries, and especially in the industries of soda, cotton spinning, ammonium fertilizer, tires and inner tubes, electric motors, watches, steel and iron castings, pulp, in which the rates of increase were larger than 10 per cent. From 1973 through 1979, labour productivity in the covered industries increased at an average annual rate of 4.5 per cent. The average annual rate of productivity change for 1973-1975 was minus 1.8 per cent, reflecting the oil crises in 1973.

/Table 1

Table 1. Annual rate of productivity change by industry

(%)

Industry	1978	1979	Average rate		
			1973 1979	1973 1975	1975 1979
Total	8.2	8.4	4.5	- 1.8	7.5
Cotton spinning	10.4	19.5	7.1	- 1.8	11.2
Wool spinning	3.0	6.5	5.3	2.1	6.8
Cotton and spun rayon fabrics	9.1	3.0	5.5	1.2	7.6
Plywood	13.6	9.6	6.4	4,1	10.6
Pulp	2.8	10.4	3.3	- 5.8	7.5
Paper	6.3	7.0	4.5	- 2.9	8.1
Ammonium fertilizer	9.1	15.1	7.4	0.5	10.7
Soda	3.8	27.8	5.6	- 4.9	10.5
Rayon	9.3	4.6	7.4	1.0	10.5
Tires and inner tubes	10.1	12.6	6.6	0.5	9.5
Cement	6.8	5.3	7.6	- 1.0	11.6
Iron and steel	5.9	9.1	1.4	- 6.0	4.9
Steel rolling	6.7	5.3	0.9	- 6.3	4.3
Steel and iron castings	7.3	10.5	5.6	- 0.8	8.7
Electric wire and cable	16.2	3.0	6.4	- 3.9	11.2
Lathes	4.3	6.3	2.6	- 23.4	13.5
Bearings	13.0	7.2	6.8	- 5.1	12.3
Electric motors	7.0	11.4	6.4	0.1	9.4
Motor vehicles	9.5	6.4	6.3	5.0	10.2
Watches	13.0	11.1	9.3	2.5	12.5

Some of the recent results by production process are shown below.

Table 2. Hours worked per ton of cotton (converted into 20^s) by production process

(unit: hours)

Production process	1978	1979
Total	72.61	58.46
Direct	69.79	56.06
Bale opening, Mixing	4.95	4.05
Carding	6.26	5.04
Combing	3.20	2.63
Drawing	5.26	4.26
Roving	9.72	7.30
Spinning	40.40	32.78
Indirect	2.82	2.40

Table 3. Hours worked per ton of castings (gray iron) by production process

(unit: hours)

Production process	1978	1979
Total	23.20	20.68
Direct	19.34	17.12
Sand preparation	0.89	0.75
Molding	7.74	6.94
Melting	2.47	2.16
Cores	3.12	2.62
Heat treatment	0.30	0.30
Finishing	4.82	4.36
Indirect	3.86	3.56
Conveyance	1.09	1.02
Testing and inspection	1.19	1.02
Repairs	1.17	1.13
Power station	0.41	0.38

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MEASUREMENT OF PRODUCTIVITY

(Item 5 of the provisional agenda)

Note by the secretariat*

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INTRODUCTION

1. Any discussion on the measurement of national productivity is likely to be rather technical and to sound somewhat academic. But the subject-matter is of profound importance since it is the rising output per man-hour which must yield the ingredients of a rising standard of living. Growth in productivity makes it possible for real wages and real profits to rise side by side. Rapid advance in productivity is the key to stability of the price level as money incomes rise, to fundamental improvement in the balance of international payments and to growth in a nation's capacity to meet the challenges of socio-economic development. Furthermore, since various forms of capital investment constitute the basic source of future gains in productivity, the importance of increases in investment outlays such as on science and technology, plant and equipment, and education and training in achieving accelerated economic growth needs to be emphasized.

I. MEASUREMENT OF PRODUCTIVITY IN PERSPECTIVE

2. In order to place the issues regarding the measurement of productivity in some sort of perspective, two general points should be recalled. First, the development of a sound statistical system is, in a fundamental sense, a grand exercise in co-operation. There are at least three reasons for this: the first reason is that statistical series come into being by rearranging, auditing and analysing the information that the public supplies. Thus, the production of good statistics necessarily involves the willing co-operation and goodwill of those who supply the basic data - individuals, business organizations, government departments, and so on. The second reason is that statistical activity is designed to produce a service which is considered important, useful and which is used. In fact, the demand for statistical information has been increasing with the growing complexity of the economy, competition and the large size of decision-making units, both public and private. The increasing interest in statistics stems from the same factors that are responsible for the growing interest in scientific management and technological improvements. In the last analysis, interest in these matters is sustained by an awareness that attention to them pays off. Thus, co-operation with the users of the data is essential in order to keep abreast of their growing and increasingly relentless needs. The third reason is that a statistical series is seldom used in isolation. As a rule, various aspects of a problem have to be considered before a policy regarding it is

/formulated.

formulated. The statistics relating to these various aspects must be comparable. The production of comparable statistics necessarily requires that the statisticians co-operate among themselves - there must be an awareness of interdependence.

3. The second general point to be made is that the development of the component parts of an integrated system of national economic intelligence necessarily involves a great deal of research, experimentation, ingenuity and time. There are many reasons for this, of which several need to be mentioned. The economic events and processes the statistics are designed to reflect are seldom simple and static; they are complex and changing. The records kept by firms and individuals of the same events frequently vary and at times are incomplete for statistical purposes. In the course of transmitting statistical requirements to respondents, opportunities for misunderstandings exist. In the ever-present quest to reduce the burden of response, shortcuts are used which, however, produce errors of a varying degree of significance. Last but not least, the science or art of measurement has by no means reached the stage of perfection.

4. These two general points - the reliance on co-operation and the need for research, experimentation and time - apply with particular force to the measurement of productivity. This is because productivity statistics are at the apex of the system of economic statistics. The antecedents, in the form of employment statistics, production statistics, price statistics and so on, have to be there, Incidentally, these antecedents are themselves dependent on the availability of a great number of statistical series. However, these antecedents have not been designed for the particular purpose of measuring productivity and, as a consequence, considerable rearrangement of the data and some adjustment of concepts are involved. Further, for productivity measurement more, or special, detail and a somewhat higher degree of accuracy are often required.

II. THE NATURE OF PRODUCTIVITY MEASUREMENT

5. As is generally realized, the notion conveyed by the word "productivity" centres around the relationship of physical outputs and physical inputs, the outputs representing the economic achievements (in a plant, an industry or the economy) and inputs representing the over-all efforts that have gone into these achievements. In measuring productivity, an attempt is made to match these outputs and inputs in such a way as to make them comparable. The matched outputs and inputs are expressed in the form of a ratio. As a rule, an

/appraisal

appraisal is made of the effectiveness with which real resources are utilized at any particular time by making comparisons with preceding periods - the preceding month, the preceding year, the preceding decade. It follows that the outputs and inputs must be comparable over time in order to render such comparisons meaningful.

6. If the composition and valuation of output, for example, were simple and unchanging from year to year and differed only in that there were changes in the amount produced, as measured, say, by the number of individual commodities, then it would be easy to construct meaningful output measures. In fact, the composition and valuation of production is complex and subject to change.

7. A concrete example may make these general statements somewhat more meaningful. In Canada, few problems are encountered in measuring the physical output of the gold-mining industry. (Owing to the homogeneity of the product in this industry in most, if not all, gold-producing countries, this statement is probably valid for most such countries.) This industry produces, for the most part, a single product that is homogeneous and has not changed over time; an ounce of gold bullion now is the same as it was in 1939. Accordingly, the change in number of ounces of gold bullion produced between 1939 and the present time is an accurate indication of the change in the volume of output of the gold-mining industry. The situation is entirely different in the case of, say, the agricultural implements industry. As is known, this industry turns out a great variety of agricultural machinery, the characteristics of which have been changing from year to year. Thus, the character of combines has changed substantially in that the conventional large types have been displaced, in recent years, by smaller varieties. A comparison of the total number of units produced has accordingly become a misleading guide to changes in the volume of production of the industry. Further, the quality of its products has improved; in the case of combines, for example, this has taken the form of attachments or built-in features that permit the combines to do a more efficient job than previously. Such changes in quality have to be detected, and, to the extent possible, incorporated in the output measure. Also, new products have appeared, for example, pick-up hay balers; these have gained in relative importance since their introduction in the early 1950s. Such innovations must also be incorporated in the output measure. Moreover, certain changes in the organization of establishments may affect the measured movements of an industry's output.

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8. The situation with regard to inputs is no more comforting. Even labour, regarded as the most readily measurable input, is a complex of skills, experience and application that may change over time and varying circumstances. However, these changes probably do not take place as rapidly as in the case of output.

9. It has been said that politics is the art of the possible. One may claim the same for statistics. Various devices have been developed, taking the form mainly of so-called index numbers, which attempt to measure the movements of output and input in such a way as to facilitate comparisons.

10. These devices are, however, based on certain simplifying assumptions about the composition and valuation of output and input that may lead to significant distortions of reality. This fact, together with the imperfections in the available statistics already referred to, imposes a responsibility on the statistician to take steps to ensure that the estimates he recommends for public use are not in fact hazardous booby-traps. The need for precision is particularly great in productivity measurement because year-to-year changes are typically small and can, therefore, be easily matched or exceeded by relatively small errors in the numerator or the denominator of the productivity ratio, and because the data may be used for rather important purposes.

11. The question then arises, how does the statistician avoid getting into the business of producing booby-traps?

12. Apart from intensive analysis of the statistical results and constant probing for "reasonableness", it is considered sound statistical practice to measure a phenomenon, particularly a complex phenomenon, in at least two ways. In addition to providing a check, each way makes available special information. If the two ways provide reasonably similar results, then there is some presumption that either, or an average of the two, is not too far off the mark.

III. A CASE STUDY

13. With this background it may now be useful to look at how the productivity measurement programme was developed in Canada during the early 1960s by the then Dominion Bureau of Statistics (DBS) and the vexing issues it faced at the time. This account, though somewhat old, may provide a useful illustration of issues and problems on which many a developing country of the ESCAP region would need to ponder when they commence their efforts in measuring productivity.

14. The programme of productivity measurement in Canada as it was envisaged in the early 1960s consisted of two parts: first, the measurement of global indexes covering the national economy, with the exception of agriculture and government activity; and secondly, developmental work on indexes for individual industries, mainly in manufacturing. It was planned to extend the indexes back to 1947 wherever possible. Some 15 industries were tentatively selected for this purpose in co-operation with the Department of Labour and other departments. It was anticipated that with the staff available, it would take some three years to carry out the work on these industries. The successful completion of the work would necessarily involve the active co-operation of the major firms. Discussion of conceptual and methodological matters with trade union officials would also be undertaken. It was impossible to say at the outset which indexes, if any, would be suitable for regular publication but it was anticipated that the research work involved would throw much light on the nature of productivity change and measurement in the industries concerned and the nature of productivity analysis in general.

15. For a number of years DBS worked on two, more or less independent, measures of national production in constant dollars. These two measures provided reasonably similar movements over time. While those data needed to be improved further particularly for the portion of the economy producing services rather than commodities, it was felt that they were as adequate for use in over-all productivity measures for the non-farm business sector of the economy as corresponding statistics in any other country.

16. With regard to input, however, DBS was in a less fortunate position. In the first place, it had to confine itself to labour input only, as the DBS work on capital input was in a very primitive stage. There were extremely complex conceptual as well as statistical problems in the measurement of capital stock. In the second place, DBS was compelled to treat all labour input as though it were homogeneous and of unchanging composition over time.

17. In the case of labour input, DBS also attempted to measure the same thing in two different ways. It started out with the two available statistical series on paid (wage and salary) workers (one from the monthly "labour force" survey and the other from the monthly "employment" survey) which, however, did not measure the same thing, even though they had much in common. The movements of those two statistical series had differed considerably in the previous few years and DBS had been exploring the factors responsible for those differences and their quantitative importance. Over a dozen such factors were being explored and the study of several had been completed. For example,

/certain

certain service industries were covered in the labour force series but not in the employment survey; part-time and casual workers were, apparently, covered to a greater extent in the labour force survey than the employment survey; the employment survey was confined to establishments employing 15 persons and over until 1961, when a sample survey of establishments with less than 15 employees was introduced. The adjustments DBS had been able to make up to that time had brought the two series closer together but they still differed by a considerable margin. It was hoped that within a year or so enough would have been learnt about the factors responsible for the remaining difference to enable the production of an acceptable series for productivity purposes. DBS would then have been able to construct an adequate series of production per paid worker. Using available incomplete and largely incompatible statistics on paid workers would have yielded a variety of indexes differing considerably from each other merely for statistical reasons.

18. By adding the number of employers to paid workers DBS got the total number of persons engaged in production. This more comprehensive measure was, from many points of view, the more suitable denominator for the productivity ratio and DBS proceeded to use those data upon their completion in order to calculate productivity indexes on that basis also. Further, the number of hours worked per year by people changed from time to time. A project aiming to produce estimates of the average number of hours worked per year by (a) paid workers and (b) employers was at an advanced stage and DBS planned to use those data to calculate output indexes per man-hours worked.

19. The construction of productivity indexes for individual industries was even more difficult. For one thing there was less opportunity for cancelling errors that came into play. For another, classification issues involving somewhat arbitrary distinctions of one industry from another loomed larger and the precise matching of outputs and inputs became more difficult. For another, there was a greater variety of methods for measuring outputs and frequently they gave results that differed significantly. It was clear that each industry would have to be studied exhaustively and in collaboration with the firms in question in order to determine the most suitable output figure for productivity purposes.

20. The agricultural implements industry was investigated in detail and other industries were gradually added to the productivity statistics development programme. The (gross) output of the agricultural implements industry,

industry, for the year 1947 to 1960, was estimated in two different ways using information from regular DBS surveys - first by deflating the index of gross value of production by a corresponding price index, and secondly, by projecting base-year values of groups of commodities by indexes representing, in the main, the number of units of these commodities that had been produced. The differences in the movement of those two indexes was large. DBS obtained additional information going back to 1956 from some of the firms in the industry. When this information was used the two indexes were brought together significantly. Confidence was felt that if certain additional information were made available to DBS for the whole time-period under study, the differences in movement of the two series would be reduced to insignificant proportions. The movement of labour input indexes for this industry, using two different sources, was reasonably close, but, because of the differences in the output measures referred to, the resulting ratios of output per paid worker differed a great deal.

IV. CONCLUDING REMARKS

21. It would appear from the above that the measurement of productivity is a complex problem and is beset with many difficulties concerning in particular the choice of appropriate indicators of output and input, ensuring comparability of the two series and correlating them to derive acceptable measures of productivity. As the Canadian experience showed, it is only over time that these problems and difficulties can be overcome. In this regard, the co-operation of a large number of individuals and enterprises who are both suppliers and users of productivity information is essential; so is that of trade union research officials. Above all, relevant statistical series need to be continued. Finally and importantly, it has been the experience of DBS that the production on a regular basis of productivity measures and their improvement over time requires a high level of consciousness as to the importance of such statistics by policy level decision makers. In particular, for the successful implementation of such a programme and its maintenance over time, adequate resources must be made available in a flexible manner to statistical authorities in order to enable them to retain their competent staff in that specialized field and to add to them if the need for this is demonstrated.